

REMARKS

The present Reply is intended to be fully responsive to all points of objection and rejection raised by Examiner and is believed to place the application in a condition for allowance. No new matter has been introduced by any of the amendments. Applicant respectfully requests reconsideration and withdrawal of Examiner's objections and rejections in view of the preceding amendments and following remarks.

Claims 1-3, 9-11, and 15-20 are now pending in the present application. Claim 1 is amended. Claims 4-7 are withdrawn from consideration. Claims 8 and 12-14 are cancelled. Claims 15-20 are newly added.

Claim 1

Claim 1 is amended to more clearly define the claimed invention by formatting the claim language with appropriate spacing and indentations and not to further limit the claim in light of the cited prior art.

Claim 1, as amended, is clearly distinguishable over the cited prior art. DE-1160319 (DE'319) features a cooling jacket (through which cooling fluid flows) that is both internal to the housing (DE'319, ref. 13) and internal to the outer axial end wall (ref. 11). Contrariwise, the claimed invention features a cooling fluid flow path that is entirely external of the defined cavity and resides entirely in the periphery of the circumferential wall.

Moreover, DE'319 features a dry brake housing as evidenced by the dust seal (ref. 32) and lack of any flexible shaft seal on the end of the axle by the bearings (ref. 20). DE'319 has one other flexible seal (ref. 17) that is for sealing the high pressure brake fluid for actuating the disc brake caliper (ref. 12). In contrast, the claimed invention discloses a seal means for completely sealing the housing to allow the housing to retain a volume of lubricating fluid in which the brakes operate.

Finally, DE'319 merely discloses a housing with one opening through which the rotatable element may extend (ref. 16). In contrast, the claimed invention allows for more than one

opening and more than one portion of the rotatable element to extend through the more than one opening.

Claim 1 is distinguishable over Pogorzelski et al. (U.S. Patent No. 5,445,242).

Pogorzelski et al. discloses an externally cooled disc brake caliper housing that merely covers a single set of brake pads and not the disc brake rotor. Contrariwise, the claimed invention discloses a housing that encircles the entire rotatable element (disc brake rotors and pads).

Claim 9

Claim 9 is amended to correct the dependency to make the claim dependent on Claim 1 (Claim 8 is cancelled). Also, this claim was amended to cleanup the claim language and to make it more readable. It is distinguishable from the prior art because it incorporates all of Claim 1's limitations.

Claim 10

Claim 10 is amended to cleanup the claim language and to make it more readable. It is distinguishable from the prior art because it incorporates all of Claim 1's limitations through its dependency on Claim 9.

Claim 11

Claim 11 is amended to correct the dependency to make the claim dependent on Claim 1 (Claim 8 is cancelled). Also, this claim was amended to cleanup the claim language and to make it more readable. It is distinguishable from the prior art because it incorporates all of Claim 1's limitations.

Claim 15

Claim 15 is added to present an embodiment as contained in the original disclosure that defines the cooling fluid flow path as being external to the defined housing cavity. Claim 15 is thus distinguishable from DE'319 because DE'319 features a cooling jacket (through which

cooling fluid flows) that is both internal to the housing (DE'319, ref. 13) and internal to the outer axial end wall (ref. 11).

Claims 16-20

Claims 16-20 are added as claims dependent upon Claim 15, each incorporating all of Claim 15's limitations. Each of the dependent claims adds a further limitation to the dependent claim. Therefore, Claims 16-20 are distinguishable from the cited prior art because independent Claim 15 is distinguishable.

INFORMATION DISCLOSURE STATEMENT

Examiner noted that Applicant's reference to US Patent No. 6,321,882 on page 1 of the specification in the Application was not a proper information disclosure statement. A proper information disclosure statement has been filed concurrently with this Reply.

CLAIM OBJECTIONS

Claims 1-3 and 8-14

Examiner objected to dependent Claims 1-3, and 8-14 because of the phrase "through circumferential wall" in line 3 from the bottom of independent claim 1 should be changed to "through the circumferential wall." In response, Claim 1 has been amended in accordance with Examiner's recommendation. Claim 8 is cancelled and Claims 9-11 are amended to depend on Claim 1. As such, applicant respectfully requests that Examiner's claim objections be withdrawn.

CLAIM REJECTIONS – 35 U.S.C. § 112

Claims 8-14

Examiner rejected Claims 8-14 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. More specifically, Examiner stated:

Re: claim 8. It is unclear to the Examiner whether the "supply of cooling fluid" in line 3 from the bottom of claim 8 is intended to be the same or different from that of claim 1.

Re: claim 14. It is unclear to the Examiner whether the "sealing means" and the "wet brake housing" in lines 1-3 of claim 14 is intended to be the same or different from the seal means of claim 1. The remaining claims are indefinite due to their dependency from claim 8.

The above issues seem to stem from the change of claim 8 from independent to dependent form. This list is not intended to be exhaustive.

In response, Claims 8 and 14 were cancelled and thus Examiner's § 112 rejection is no longer valid. Applicant respectfully requests Examiner withdraw the rejection.

CLAIM REJECTIONS – 35 U.S.C. § 102

Claims 1-3, 8, and 11-14

Examiner rejected claims 1-3, 8, and 11-14 under 35 U.S.C. § 102(b) as being anticipated by DE-1160319 (DE'319). More specifically, Examiner stated:

Re: claims 1-3. DE'319 shows in the figure a fluid cooled brake housing 10 for a brake system that includes a rotatable element to be braked, the brake housing comprising at least *a casing* having a *circumferential wall* shown between the lead lines of 25 and 30 and *two axial end walls* one extending above the lead line of 25 and the other extending above the lead line of 30 that define a *cavity for housing one or more friction pads* 15 of the brake system, *a fluid inlet 24 in fluid communication with a fluid flow path* shown throughout areas 11 and 13 that is *internal to the circumferential wall*, and *a fluid outlet 29 in fluid communication with the fluid flow path*, *an opening in the casing* shown surrounding element 19 *through which a portion of the rotatable element can extend*, a seal means 17, 32 for sealing the opening such that the casing can be at least partially filled with a volume of lubricating fluid 23 to provide a wet brake housing, and *whereby when a supply of cooling fluid is coupled with the fluid inlet, cooling fluid flows through the circumferential wall via the fluid inlet, the fluid flow path and fluid outlet thereby cooling the housing*.

Re: claim 14. DE'319 shows the housing further including sealing means 17, 32 for sealing the cavity when the housing is mounted on an axle shown supported within elements 20 to provide a wet brake housing.

Re: claims 8 and 11-13. DE'319 shows in the figure a fluid cooled brake system including one or more brake pads 15 disposed in the cavity as shown, braking surface of element 15 located within the cavity as shown, an actuator 12 for selectively moving the one or more pads into contact with the braking surface, and a supply of cooling fluid external of the cavity and in fluid communication with the fluid inlet and the fluid outlet, whereby the cooling fluid circulates through the supply, the fluid inlet, fluid flow path and fluid outlet.

A prior art reference anticipates the claimed invention under 35 U.S.C. § 102 only if every element of a claimed invention is identically shown in that single reference, arranged as they are in the claims. *In re Bond*, 910 F.2d 831, 832, 15 U.S.P.Q.2d 1566, 1567 (Fed. Cir. 1990).

In response to Examiner's § 102 rejections, Claims 8 and 12-14 have been cancelled. Claim 11, as amended, is now directly dependent upon claim 1 and includes all of Claim 1's limitations. Claim 1 has been amended to more clearly define the invention and is now more readily distinguishable from the cited prior art.

DE'319 does not anticipate Claim 1 or Claim 15 because it does not show a fluid flow path in the circumferential wall external to the cavity of the housing. The present invention, as embodied in independent Claims 1 and 15, features a cavity (Fig. 2, 14) formed by a circumferential wall (Fig. 2, 16) and two axial end walls (Fig. 2, 18 and 20). The fluid flow path (Fig. 2, 36) is formed entirely within the circumferential wall and is completely external to the defined cavity. Cooling fluid from the fluid flow path does not enter the cavity or any portion of the two axial end walls.

Contrariwise, DE'319 teaches a cooling jacket (11) that is located inside what is essentially the equivalent of an axial end wall of the present invention. In addition, the cooling jacket (13) is formed inside the stationary brake disc (12) which actuates the braking method by placing pressure on the friction brake lining (15) and, consequently, the rotating central brake disc (14). Because the piston device (12) is located entirely within the housing cavity, so is the cooling jacket (13).

DE'319 does not anticipate Claim 1 or Claim 20 because it does not show a seal means for sealing the opening of the cavity in order to create a wet brake system. The present invention, as embodied in independent Claims 1 and 15, features a seal means (Fig. 6, 66) for sealing the cavity (Fig. 6, 14). This allows the cavity to contain a volume of lubricating fluid to provide for a wet brake housing (Fig. 6, 56). This lubricating fluid is independent of the cooling fluid and the brake fluid used to actuate the disc brakes.

Contrariwise, DE'319 features two "seals" that Examiner grossly mischaracterizes. The collar (32) is intended solely to "seal externally the brake against oil and dust" (**partial translation, column 3, line 54 to column 4, line 21**), not to contain a volume of lubricating fluid. Also, the brake cylinder (17) is a seal means for sealing the pressurized oil for braking (**column 4, lines 25-30**) and not for sealing lubricating oil for a wet brake as Examiner claims. To assist understanding, a machine translation of the section of the patent is as follows:

German patent language, column 4, lines 25-30:

Zum Bremsen wird der Bremszylinder 17 über die Leitung 23 mit Drucköl beliefert, wodurch über den Ringkolben 18 die Brems- oder Druckscheibe 12 nach rechts verschoben und dadurch die mittlere Bremsscheibe 14 zwischen den äußeren Bremsscheiben 10 und 12 festgebremst wird.

Machine translation by <http://www.freetranslation.com>:

For braking is supplied the brake cylinders 17 over the direction 23 with pressure oil by what means over the ring pistons 18 the brake disk or pressure disk 12 shifted to the right and becomes through it the middle brake disk 14 between the external brake disks 10 and 12 festival brakes.

Further still, DE'319 mentions that prior art includes "multi-disc brakes that run in oil" (**partial translation, column 1, lines 18-27**). The "multi-disc brakes that run in oil" also features lubricating oil that serves as the cooling fluid (**partial translation, column 1, lines 18-27**). Thus, because this prior art is actually *DE'319 prior art*, it is doubtful that DE'319 would seek to teach a similar wet brake. On the contrary, DE'319 teaches a dry brake with the cavity sealed from *external* oil and dust (**partial translation, column 3, line 54 to column 4, line 21**) (emphasis added).

Accordingly, DE'319 does not show every element of the claimed invention arranged as they are in the claims. Because DE'319 does not anticipate independent Claims 1 and 15, it does not anticipate the dependent claims. It is respectfully requested that Examiner's § 102(b) anticipation rejection be withdrawn and the claims allowed as amended.

CLAIM REJECTIONS – 35 U.S.C. § 103

Claims 9 and 10

Examiner rejected claims 9 and 10 under 35 U.S.C. § 103(a) as being unpatentable over DE'319 in view of Pogorzelski et al. (U.S. Patent No. 5,445,242). More specifically, Examiner stated:

Re: claim 9. DE'319 is silent with regards to how the cooling fluid is circulated. Pogorzelski et al. teach in figure 1 a pump 94 for pumping the cooling fluid through the supply and the fluid flow path.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified one of the ends of the fluid inlet of DE'319, to have been connected to a pump, as taught by Pogorzelski et al., in order to provide a means of circulating the cooling fluid through the cooling system in order to effectively prevent overheating of the brake device.

Re: claim 10. DE'319 is silent with regards to a heat exchanger being in fluid communication with the supply for cooling the cooling fluid. Pogorzelski et al. teach in figure 1 a brake device including a heat exchanger 96 in fluid communication with the supply for cooling the cooling fluid.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the cooling system of DE'319 to have included a heat exchanger, as taught by Pogorzelski et al., in order to provide a means of controlling heat dissipation within the system.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). “All words in a claim must be considered in judging the patentability of that claim against the prior art.” *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). In comparing both DE'319 and Pogorzelski et al. to the claimed invention to determine obviousness, limitations of the presently claimed invention may not be ignored.

The present invention in independent claim 1 recites “a fluid flow path formed around the periphery of the circumferential wall such that the fluid flow path is external to the defined cavity.” Such features are neither taught nor suggested by either of the cited prior art references. Therefore, Claim 1 is nonobvious despite DE'319 in view of Pogorzelski et al.

For example, DE'319 provides a brake cooling system that features cooling water jackets inside the defined cavity as well as inside an axial end wall. One of the cooling jackets is even internal to a disc brake piston attached to one of the brake linings. The present invention

provides a cooling fluid flow path that is inside the circumferential wall, which is entirely outside of the cavity and not at all part of a disc brake piston.

Pogorzelski et al. fails to teach or suggest the fluid flow path as well since it deals solely with disc brake calipers having internal cooling passages to cool only the brake fluid. In addition, Pogorzelski et al. does not provide for a wet brake system as does the present invention.

Claim 10 is dependent upon Claim 9 and therefore includes all of the limitations of Claim 9. Because Claim 8 was cancelled, Claim 9 was amended and is now dependent on Claim 1. Consequently, Claim 9 now includes all of Claim 1's limitations. Claim 1 was amended to more clearly and distinctly point out the claimed invention. For the reasons discussed previously in the § 102 rejection response, independent Claim 1 is distinguishable from prior art reference DE'319.

Due to the limitations of Claim 1, DE'319 in view of Pogorzelski et al. neither teaches nor suggests all claim limitations and thus Examiner's § 103(a) obviousness rejection of Claims 9 and 10 is improper. Applicant respectfully requests that Examiner withdraw the rejection and allow the claims as amended.

CONCLUSION

Applicant has adopted the Examiner's suggestions, where applicable, and believes the claims are now in condition for allowance. No new matter has been added by the requested amendments. It is respectfully urged that the subject application is patentable over references cited by Examiner. Applicant requests reconsideration of the application and allowance of the claims. If there are any outstanding issues that the Examiner feels may be resolved by way of a telephone conference, Examiner is cordially invited to contact David W. Carstens at 972-367-2001.

The Commissioner is hereby authorized to charge any shortages or credit any overpayments to Deposit Account 50-0392.

Respectfully submitted,

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